

## ABSTRACT OF THE DISCLOSURE

A semiconductor diode with hydrogen detection capability includes a semiconductor substrate, a doped semiconductor active layer formed on the substrate and made from a compound having the formula XYZ, in which X is a Group III element, Y is another Group III element different from X, and Z is a Group V element, a semiconductor contact-enhancing layer formed on the active layer and made from a compound having the formula MN, in which M is a Group III element, and N is a Group V element, an ohmic contact layer formed on the semiconductor contact-enhancing layer, and a Schottky barrier contact layer formed on the active layer. The Schottky barrier contact layer is made from a metal that is capable of dissociating a hydrogen molecule into hydrogen atoms.